



International Civil Aviation Organization
CAR/SAM Regional Planning Implementation Group (GREPECAS)
**First Meeting of the Communications, Navigation and Surveillance / Air
Traffic Management Subgroup (CNS/ATM/SG/1)**
(Lima, Peru, 15 to 19 March 2010)

**Agenda Item 3: Review of the terms of reference and working methodology of the
CNS/ATM Subgroup**

Proposals on the methodology and functional structure of the new CNS/ATM Subgroup

(Presented by the Secretariat)

Summary	
On the basis of the background that determined the establishment of the CNS/ATM Subgroup by GREPECAS/15 meeting, this working paper presents, for the Meeting's evaluation, two possible proposals for the methodology and functional structure of the new CNS/ATM Subgroup.	
References:	
<ul style="list-style-type: none">• ACG/7 report (Lima, 3 to 4 March 2008); and• GREPECAS/15 report (Rio de Janeiro, Brasil, 13 to 17 October 2008)	
ICAO strategic objectives:	<i>A – Safety</i> <i>D - Efficiency</i>

1. Background

1.1 During ACG/7 meeting (Lima, March 2008) the work programme and matters relating to the operation of the GREPECAS Subgroups were examined. Among the topics reviewed, was the subject regarding the functioning of the ATM/CNS Subgroup. ACG/7 meeting recommended that GREPECAS/15 consider the deactivation of the Subgroup and the establishment of two Subgroups, one CNS and the other, ATM.

1.2 GREPECAS/15 meeting examined ACG/7 recommendations, but deemed it better to reconfigure the ATM/CNS Subgroup instead of creating two subgroups, since this would mean a step back in CAR/SAM planning as regards CNS/ATM subjects, and in the coordination of other air navigation areas.

2. Analysis

2.1 The following paragraphs present an analysis to the subjects defined during GREPECAS/15 meeting with respect to the new CNS/ATM Subgroup and its possible working methodology, on the basis of GREPECAS/15 directives.

Terms of Reference of the new CNS/ATM Subgroup

2.2 GREPECAS/15 meeting formulated Decision 15/34, which establishes the new CNS/ATM Subgroup by restructuring the old ATM/CNS Subgroup, with the aim of ensuring a better coordination on ATM and CNS matters and developing a performance-based CAR/SAM planning with views to the implementation of a global ATM system.

2.3 GREPECAS/15, upon restructuring the Subgroup, did so with the intent that this GREPECAS contributory body operate in correspondence with the procedures in the GREPECAS handbook, and that it:

- a) aligns its work programme with global developments, taking into consideration performance objectives;
- b) define specific tasks, their deliverables in set dates and that it carries out an efficient management in their execution; and
- c) develop its work programme during its first meeting, taking under consideration the tasks carried out under the CNS/ATM Subgroup, through its ATM and CNS Committees and respective Task Forces.

2.4 The terms of reference of the new Subgroup, and the tasks to develop are shown in **Appendix A.**

CNS/ATM Subgroup working methodology proposal

2.5 To develop a working methodology proposal for the CNS/ATM Subgroup, account has been taken on matters relating to the operation of the GREPECAS mechanism, its directives and, also, the current *modus operandi* of the planning/implementation mechanisms established in each CAR and SAM Region, in correspondence to the ICAO regional programmes. These matters are the following:

- a) Each region has its own established planning/implementation mechanisms, which operate through informal meetings and working groups supported by Special Implementation Projects (SIPs) and technical cooperation projects, seminars and workshops. In certain cases, joint (CAR/SAM) discussion and/or training events are held. These mechanisms provide input to the GREPECAS Subgroups and Task Forces and, at the same time, are feedback from GREPECAS directives, which searches for a joint CAR/SAM planning.
- b) Appendix A indicates that the CNS/ATM Subgroup should facilitate and harmonize the inter-regional implementation process. Taking this matter under consideration as well as a) above, it can clearly be appreciated that GREPECAS can carry out CAR/SAM planning as regards CNS/ATM, but only by combining these initiatives with an inter-regional planning, with the aim of harmonizing any planning in the interphase of both regions in order to achieve the required inter-operability.
- c) GREPECAS, under advisement of the CNS/ATM Subgroup, would serve as a catalytic and provide the high level directives required to orient the initiatives and harmonization of CAR/SAM level plans. In this sense, for example, harmonized plans are required for PBN, ATFM, communications systems and their corresponding applications, air navigation automation services, among others.

- d) The States implementation processes, as currently carried out, would be in charge of the mechanisms established for this purpose in the regions, with the coordination of the ICAO Regional Offices.

CNS/ATM Subgroup work plans/projects

2.6 GREPECAS/15 has given a directive as regards the need that the CNS/ATM develop its work programme with indication of tasks under a project development concept, taking into consideration the performance objectives already established by GREPECAS, and included in the terms of reference of the CNS/ATM Subgroup, which are shown in **Appendix B**. In this respect, the Subgroup might propose other performance objectives, as required.

2.7 The performance objectives agreed by the Subgroup (the performance objectives already established by GREPECAS and included in the terms of reference of the CNS/ATM Subgroup and any new ones to be agreed upon) will form part of the Regional Performance Based Air Navigation Implementation Plan for the CAR/SAM Regions presented in WP/06 of this Meeting.

2.8 The concept of “project” should be understood as a set of tasks to be carried out. To develop a work programme on the basis of performance objectives implies defining an expected result, defining the tasks to carry out to achieve the expected result, the starting and ending dates, and the person responsible for their carrying out. To permit a better comprehension of each performance objective, with views to its implementation, the Subgroup will define detailed tasks, grouped as work/project plans, for the follow-up to the planning and support of the implementation.

2.8 For the achievement of the performance objectives of the Regional Performance Based Air Navigation Implementation Plan for the CAR/SAM Regions, the corresponding tasks would be grouped into work/project plans. For the carrying out of the work/project plans, the Secretariat presents two proposals, with their respective functional structure, similar but different in the following:

- a) Proposal (**Appendix C**) in which the carrying out of the work/project plans would be in charge of the group of experts identified as working groups. Within each working group, specific work/project plans will be defined, identified as “projects”. The responsibility for the carrying out of each project would be in charge of a project chief.
- b) Proposal (**Appendix D**) in which the carrying out of the work/project plans would be in charge of the group of experts identified as task forces. The responsibility for the carrying out of task force would be in charge of a rapporteur. Within each task force, specific work/project plans will be defined, identified as “tasks”.

2.9 The chief of projects, rapporteurs and experts in charge of the carrying out of the work/Project plans will be persons named by the States members of the Subgroup. The States aeronautical administrations members of the Subgroup should provide all support necessary to the personnel in charge of the management of the tasks of the work/project programme. For both proposals, ICAO will act as coordinator of these Working Groups/Task Forces.

2.10 The Terms of Reference of the CNS/ATM Subgroup in Appendix A identify three macro-tasks to be developed: a) those related with the Air Navigation Plan and its amendments, b) those with the dealing of deficiencies, and c) work plans to develop taking under consideration the performance objectives for the implementation of air navigation services.

3. **Action suggested**

3.1 The Meeting is invited to consider the information presented in this working paper, taking into account Appendices A and B herewith, and in the light of same:

- a) Review the work methodology and functional structure of the CNS/ATM Subgroup proposed and presented in Section 2 of this working paper and in Appendices C and D and respective Attachments;
- b) Adopt one of the methodologies and structure of the CNS/ATM Subgroup, which will guide in the development of the Subgroup's work programme, to be dealt with under Agenda Item 5; and
- c) Analyze and recommend other related actions that the Meeting might consider necessary.

APPENDIX A

TERMS OF REFERENCE OF THE CNS/ATM SUBGROUP

Terms of Reference (TOR)

1. To plan a performance based transition to the ATM system envisaged in the Global ATM Operational Concept, considering the regional performance objectives, supported by the Global Air Navigation Plan Initiatives (GPIs);
2. Carry out CNS/ATM CAR/SAM planning activities to facilitate and harmonize the inter-regional implementation process to obtain in the near and medium terms, clear benefits for the ATM community; and
3. In meeting these TOR, the Subgroup should perform the following tasks:
 - a) monitor the CNS/ATM aspects of the CAR/SAM Air Navigation Plan and propose corresponding amendments to keep it up-to-date;
 - b) identify and report CNS/ATM air navigation deficiencies based on the Council approved methodology and GREPECAS complemented procedures; and
 - c) considering the existing performance objectives (new objectives to be developed as necessary), develop detailed tasks, identify deliverables with deadlines and monitor implementation of the following:
 - Performance based navigation
 - Air Traffic Flow Management
 - Civil/Military coordination
 - Automation
 - Situational awareness (surveillance)
 - RVSM
 - Communication infrastructure for ground to ground and ground to air
 - Transition to the new ICAO Model Flight Plan
 - Determine environmental benefits as consequence of short- and medium-term ATM improvements

Composition: Argentina, Antigua, Barbados, Bolivia, Brazil, Chile, Colombia, Cuba, Dominican Republic, Ecuador, Francia, Guatemala, Haití, Jamaica, Mexico, Panama, Paraguay, Perú, Spain, Trinidad & Tobago, United Staes, Uruguay, Venezuela, ARINC, COCESNA, IATA, IFALPA, IFATCA and SITA.

APPENDIX B

ATM PERFORMANCE OBJECTIVES FOR THE CAR AND SAM REGIONS

OPTIMIZE THE ATS ROUTE STRUCTURE EN-ROUTE AIRSPACE			
<i>Benefits</i>			
Environment	• reductions in fuel consumption;		
Efficiency	• ability of aircraft to conduct flight more closely to preferred trajectories;		
	• increase in airspace capacity;		
	• facilitate utilization of advanced technologies (e.g., FMS based arrivals) and ATC decision support tools (e.g., metering and sequencing), thereby increasing efficiency.		
<i>Strategy</i>			
TASK	DESCRIPTION	START-END	STATUS
AOM	<ul style="list-style-type: none"> • Develop regional action plan • Develop Airspace Concept based in CAR /SAM PBN Roadmap, in order to design and implement a trunk route network, connecting major city pairs in the upper airspace and for transit to/from aerodromes, on the basis of PBN and, in particular, RNAV/5, taking into account interregional harmonization • Develop performance measurement plan • Formulate safety plan • Establish collaborative decision making (CDM) process • Publish national regulations for aircraft and operators approval using PBN manual as guidance material • Identify training needs and develop corresponding guidelines • Formulate system performance monitoring plan • monitor implementation progress in accordance with CAR/SAM PBN implementation roadmap and State implementation plan 	2007-2009	
References	GPI/5: performance-based navigation, GPI/7: dynamic and flexible ATS route management, GPI/8: collaborative airspace design and management, GPI/10: terminal area design and management, GPI/11: RNP and RNAV SIDs and STARs and GPI/12: FMS-based arrival procedures.		

OPTIMIZE THE ATS ROUTE STRUCTURE IN TERMINAL AIRSPACE			
<i>Benefits</i>			
Environment Efficiency	<ul style="list-style-type: none"> • reductions in fuel consumption; • ability of aircraft to conduct flight more closely to preferred trajectories; • increase in airspace capacity; • facilitate utilization of advanced technologies (e.g., FMS based arrivals) and ATC decision support tools (e.g., metering and sequencing), thereby increasing efficiency. 		
<i>Strategy</i>			
TASK	DESCRIPTION	START- END	STATUS
AOM	<ul style="list-style-type: none"> • Develop State PBN implementation plan • Develop Airspace Concept based in CAR /SAM PBN Roadmap, in order to design and implement optimized standard instrument departures (SIDs), standard instrument arrivals (STARs), instrument flight procedures, holding, approach and associated procedures, on the basis of PBN and, in particular RNAV/1 and Basic-RNP12 • Develop performance measurement plan • Formulate safety plan • Establish collaborative decision making (CDM) process • Publish national regulations for aircraft and operators approval using PBN manual as guidance material • Identify training needs and develop corresponding guidelines • Formulate system performance monitoring plan • develop a regional strategy and work programme for implementation; and • monitor implementation progress in accordance with CAR/SAM PBN implementation roadmap and State implementation plan 		
References	GPI/5: performance-based navigation, GPI/7: dynamic and flexible ATS route management, GPI/8: collaborative airspace design and management, GPI/10: terminal area design and management, GPI/11: RNP and RNAV SIDs and STARs and GPI/12: FMS-based arrival procedures.		

IMPLEMENT RNP APPROACHES			
<i>Benefits</i>			
Efficiency	<ul style="list-style-type: none"> • Improvements in capacity and efficiency at aerodromes. 		
Safety	<ul style="list-style-type: none"> • Improvements in safety at aerodromes. 		
<i>Strategy (2008-2015)</i>			
TASK	DESCRIPTION	START- END	STATUS
AOM	<ul style="list-style-type: none"> • Develop State PBN implementation plan • Develop Airspace Concept based in CAR /SAM PBN Roadmap, in order to design and implement RNP APCH with Baro-VNAV in accordance with assembly resolution A36-23, and RNP AR APCH where beneficial • Develop performance measurement plan • Formulate safety plan • Establish collaborative decision making (CDM) process • Publish national regulations for aircraft and operators approval using PBN manual as guidance material • Identify training needs and develop corresponding guidelines • Formulate system performance monitoring plan • monitor implementation progress in accordance with CAR/SAM PBN implementation roadmap and State implementation plan 		
References	GPI/5: performance-based navigation, GPI/7: dynamic and flexible ATS route management, GPI/8: collaborative airspace design and management, GPI/10: terminal area design and management, GPI/11: RNP and RNAV SIDs and STARs and GPI/12: FMS-based arrival procedures.		

ENHANCE CIVIL/MILITARY COORDINATION AND CO-OPERATION			
<i>Benefits</i>			
Efficiency	<ul style="list-style-type: none"> • increase airspace capacity; • allow a more efficient ATS route structure 		
Continuity	<ul style="list-style-type: none"> • ensure safe and efficient action in the event of unlawful interference; • make available military restricted airspace more hours of the day so that aircraft can fly on their preferred trajectories; and • improve search and rescue services. 		
<i>Strategy (2008-2012)</i>			
TASK	DESCRIPTION	START- END	STATUS
AOM	<ul style="list-style-type: none"> • develop guidance material on civil/military coordination and co-operation to be used by States/Territories to develop national policies, procedures and rules; • establish civil/military coordination bodies; • arrange for permanent liaison and close cooperation between civil ATS units and appropriate air defense units; • conduct a regional review of special use airspace; • develop a regional strategy and work programme for implementation of flexible use of airspace in a phased approach beginning with more dynamic sharing of restricted airspace while working towards full integration of civil and military aviation activities by 2012; and • monitor implementation progress 		
References	GPI/1: flexible use of airspace.		

ALIGN UPPER AIRSPACE CLASSIFICATION			
<i>Benefits</i>			
Efficiency	<ul style="list-style-type: none"> • better utilization of data link communication; • optimize use of flight plan data processing systems; • enhance airspace management coordination, message exchange capabilities and utilization of flexible and dynamic airspace management techniques; 		
Continuity	<ul style="list-style-type: none"> • harmonization of interregional coordination processes; • improvement of airspace interoperability and seamlessness; and • ensure the provision of positive air traffic control services to all aircraft operations. 		
<i>Strategy (Target: 2008)</i>			
TASK	DESCRIPTION	START- END	STATUS
AOM	<ul style="list-style-type: none"> • Develop a regional implementation strategy and work programme for the implementation of ICAO Annex 11 airspace Class A above FL 195. • identify key stakeholders, ATCOs, pilots, and relevant international organisations for coordination and cooperation on changes for new airspace organization, using a CDM process; • develop new national airspace organization in accordance with ICAO provisions, as needed; • Coordinate changes for regional and national documents; <ul style="list-style-type: none"> • Doc 8733, CAR/SAM ANP; • AIP; and, • ATS letters of agreement • Carry out improvements in ground systems to support new airspace organization configurations, as necessary; • Publish national regulatory material for implementation of new rules and procedures to reflect airspace organizational changes; • Train ATCOs and pilots in new procedures, including all civil and military airspace users, as required; • monitor implementation progress. 		
References	GPI/4: align upper airspace classification.		

IMPROVE DEMAND AND CAPACITY BALANCING			
<i>Benefits</i>			
Environment	<ul style="list-style-type: none"> reduction in weather- and traffic-induced holding, leading to reduced fuel consumption and emissions; 		
Efficiency	<ul style="list-style-type: none"> improved and smoother traffic flows; improved predictability; improved management of excess demand of service in ATC sectors and aerodromes; improved operational efficiency; enhanced airport capacity; enhanced airspace capacity; and 		
Safety	<ul style="list-style-type: none"> improved safety management. 		
<i>Strategy</i> <i>Near term (2008)</i>			
TASK	DESCRIPTION	START- END	STATUS
ATFM (DCB)	<ul style="list-style-type: none"> identify key stakeholders (ATC service providers and users, military authorities, airport authorities, aircraft operators and relevant international organisations) for purposes of coordination and cooperation, using a CDM process; identify and analyse traffic flow problems and develop methods for improving efficiencies on gradual basis, as needed, through enhancements in current: <ul style="list-style-type: none"> airspace organization and management (AOM) and airway structure (unidirectional routes), communication, navigation and surveillance systems, aerodrome capacity, ATS capacity, and ATS letters of agreement; define common elements of situational awareness between FMUs; <ul style="list-style-type: none"> common traffic displays, common weather displays (Internet), communications (teleconferences, web), and daily teleconference/messages methodology advisories; develop methods to establish demand/capacity forecasting; develop a regional strategy and work programme for harmonized implementation of ATFM service; and, 		

<i>Medium term (2010)</i>			
TASK	DESCRIPTION	START- END	STATUS
	<ul style="list-style-type: none"> • define a regional strategy to implement the use of a flexible upper airspace (FUA); • evaluate the management processes in the use of the airspace; • improve the current domestic airspace management to adjust dynamic changes to the traffic flows in tactical stages; • introduce improvements to the ground ATS systems and associated procedures for the extension of the FUA with dynamic management processes in the use of the airspace • dynamically implement ATC sectorization with the aim of providing a better balance between demand and capacity that responds in real time to changing situations in the traffic flows and to accommodate in the short-term the users preferred trajectories; • define common electronic information and minimum databases required for decision support and alerting systems for interoperable situational awareness between Centralized ATFM units; • develop regional procedures for efficient and optimum use of aerodrome and runway capacity; • develop a regional ATFM procedural manual to manage demand/capacity balancing; • develop a regional strategy and framework for the implementation of Centralized ATFM unit; • develop operational agreements between Centralized ATFM units for interregional demand/capacity balancing; and, • monitor implementation progress. 		
References	GPI/1: flexible use of airspace; GPI/6: air traffic flow management; GPI/7: dynamic and flexible ATS route management; GPI/9: Situational awareness; GPI/13: aerodrome design and management; GPI/14: runway operations; and GPI/16: decision support and alerting systems.		

IMPROVE ATM SITUATIONAL AWARENESS			
<i>Benefits</i>			
Efficiency	<ul style="list-style-type: none"> • enhanced traffic surveillance; • enhanced collaboration between flight crew and the ATM system; • improved collaborative decision-making through sharing electronic aeronautical data information; • reduction of workload for both pilots and controllers; • improved operational efficiency; • enhanced airspace capacity; 		
Safety	<ul style="list-style-type: none"> • improved implementation on a cost-effective basis; • improved available electronic terrain and obstacle data in the cockpit; • reduction of the number of controlled flight into terrain related accidents; and • improved safety management. 		
<i>Strategy</i> <i>Near term (2010)</i>			
TASK	DESCRIPTION	START- END	STATUS
ATS (ATM SDM)	<ul style="list-style-type: none"> • identify parties concerned • identify the automation level required according to the ATM service provided in airspace and international aerodromes, assessing <ul style="list-style-type: none"> ○ operational architecture design, ○ characteristics and attributes for interoperability, ○ data bases and software, and ○ technical requirements; • improve ATS interfacility communication • implement flight plan data processing system and electronic transmission tools • implement radar data sharing programs where benefits can be obtained • develop situational awareness training programmes for pilots and controllers • implement ATM surveillance systems for situational traffic information and associated procedures • implement ATS automated message exchanges, as required <ul style="list-style-type: none"> ○ FPL, CPL, CNL, DLA, etc. • implement automated radar handovers, where able; • implement ground and air electronic warnings, as needed <ul style="list-style-type: none"> ○ Conflict prediction ○ Terrain proximity ○ MSAW ○ DAIW ○ Surveillance system for surface movement • implement data link surveillance technologies and applications: ADS, CPDLC, AIDC, as required 		

<i>Medium term (2015)</i>			
TASK	DESCRIPTION	START- END	STATUS
	<ul style="list-style-type: none">• implement additional/advanced automation support tools to increase aeronautical information sharing<ul style="list-style-type: none">• ETMS or similar• MET information• AIS/NOTAM dissemination• Surveillance tools to identify airspace sector boundaries• Use of A-SMGC in specific aerodromes, as required• implement teleconferences with ATM stakeholders• monitor implementation progress		
References	GPI/1: flexible use of airspace; GPI/6: air traffic flow management; and GPI/7: dynamic and flexible ATS route management; GPI/9: Situational awareness; GPI/13: aerodrome design and management; GPI/14: runway operations; and GPI/16: decision support and alerting systems; GPI/17: implementation of data link applications; GPI/18: aeronautical Information; GPI/19: meteorological systems.		

APPENDIX C

PROPOSAL ON THE WORKING METHODOLOGY AND STRUCTURE OF THE CNS/ATM SUBGROUP, ON THE BASIS OF PROJECTS IMPLEMENTATION COORDINATED BY WORK GROUPS

1. OBJECTIVE

1.1 Present a working methodology to define and carry out work/project plans that satisfy the implementation of tasks assigned by GREPECAS to the CNS/ATM Subgroup and taken under consideration within its terms of reference (TORs).

2. GENERAL CONSIDERATIONS

2.1 The terms of reference of the CNS/ATM Subgroup, as well as the tasks that should be carried out to comply with same are shown in **Appendix A** to this working paper.

2.2 In the CNS/ATM Subgroup TORs, macro-tasks 3 a) and 3 b) represent permanent-type tasks. These tasks should be developed by the CNS/ATM Subgroup Secretariat, with the assistance of the Subgroup. During the meetings of the CNS/ATM Subgroup, the progress made on these macro-tasks would be reviewed.

2.3 As regards macro-task 3 c) of the CNS/ATM Subgroup TORs, which include the performance objectives indicated in **Appendix B** to this working paper, as well as possible new performance objectives, detailed tasks should be drafted as well as identify products to deliver with target dates, and monitor the implementation of the following:

- a) Performance based navigation
- b) Air traffic flow management
- c) Civil/military coordination
- d) Automation
- e) Situational awareness (surveillance)
- f) RVSM
- g) Ground-ground and ground-air communications infrastructure
- h) Transition to the new ICAO flight plan model
- i) Determine environmental benefits as consequence of short- and medium-term ATM improvements

3. WORKING METHODOLOGY

3.1 Development of TORs macro-tasks 3 a) and 3 b)

3.1.1 The review of the air navigation plan is a continuous task of the ICAO Secretariat, in coordination with States. The regional planning/implementation mechanisms examine the CAR/SAM Air Navigation Plan (CAR/SAM ANP), in correspondence to dynamic implementation processes. In addition, as consequence of the development of the TORs macro-task 3 c), amendments to the CAR/SAM ANP can originate. All these topics will be documented by the Secretariat and presented to the Subgroup for its consideration and later submittance to the consideration of GREPECAS, with the aim of counting with CAR/SAM amendments consolidated in the ANP.

3.1.2 The dealing of deficiencies in the CNS/ATM area would be developed taking under consideration the application of the methodology approved by Council to that effect; this has been complemented with an additional procedure approved by the ASB at GREPECAS/15 meeting. The Secretariat will present at each Subgroup meeting the status in the dealing of deficiencies; the Subgroup, considering the comments of the Secretariat, will examine them and will be able to formulate measures, in the event necessary, to facilitate the solution of the deficiencies. The results of this analysis will be sent to GREPECAS through the ASB.

3.2 **Development of TORs macro-task 3 c)**

3.2.1 The work of the CNS/ATM Subgroup will be developed under a performance based approach, using the performance reference frameworks (PFFs), through the development of projects where identification will be made of the ATM Operational Concept element, the deliverable or intermediate result with the associated Global Plan initiatives/strategies (GPI), the person responsible and the target date. It is important to note that the CAR and SAM Regions have implementation plans on most of these topics. The projects should take under consideration the particular plans of each region and, fundamentally, harmonize them in the inter-regional interphase, with the aim of carrying out a CAR/SAM development planning.

3.2.2 For the carrying out of TORs macro-task 3 c), the Subgroup should count with a structure such as the shown in the **Attachment** to this Appendix.

3.2.3 The tasks detailed in the TORs macro-task 3 c) would be developed through four initial Work Groups that would compose the main structure of the CNS/ATM Subgroup.

3.2.4 Each Work Group will have a group of projects assigned to it. The coordination of the Work Group will be in charge of an ICAO ATM or CNS Regional Officer from the NACC and SAM Offices.

3.2.5 Each project will have a project chief and a group of experts responsible for the carrying out of the activities scheduled in same. The people to form part of the project will come from States and Organizations members of the CNS/ATM Subgroup. The financing of the work of the experts in the project will be covered by the States from which they come from. In certain cases to be identified, the ICAO regional projects might provide specific assistance.

3.2.6 The general work would be developed as follows:

- a) The coordinators of the work groups for the management in the development of the projects and assistance to the experts from the States in charge of carrying out the projects will be the ATM and CNS Regional Officers from the NACC and SAM Offices.
- b) The projects will be carried out by experts that States/Territories/International Organizations name at meetings of the Subgroup, who should count with the total support in resources from their States/Territories/International Organizations, for the development of the activities required.
- c) The Subgroup will define the number of Work Groups necessary, and of the associated projects. The implementation of new necessary Work Groups or the conclusion of an existing project, will be decided upon by the Subgroup.

- d) The chief of the project, under coordination with the coordinator of the Work Group, will be responsible for the carrying out of the assigned project. The experts assigned for the carrying out of the activities of a project should follow the guidelines of the chief of the project.
- e) To harmonize CAR and SAM developments, the carrying out of activities might require the concurrence of experts from both regions, at a given moment.
- f) The experts will work through the use of the Internet and will be able to coordinate their work amongst them and the Regional Officers, through electronic means and/or teleconferences.
- g) In the event necessary, the Work Groups will be able to meet in order to coordinate the progress of their activities.
- h) The experts will present their work at the dates required by the Subgroup, and indicated in the activities of the project.
- i) The Regional Officer in charge of the Work Group will document the progress made with regard to the associated projects at each meeting of the Subgroup, and will provide a report in that respect.
- j) The Subgroup will examine the work developed by the projects and will inform GREPECAS on their progress and results.
- k) Upon completing the scope of the work, the experts will end their assistance in the activities they were charged with. The Regional Officers in charge of the Work Groups will be the focal points for any coordination necessary with the projects from the various Work Groups.

4. **FUNCTIONAL STRUCTURE OF THE CNS/ATM SUBGROUP**

4.1 The functional structure of the Subgroup proposed here, considers a simple organization for the Subgroup. The Attachment to this Appendix presents the functional structure proposed for the Subgroup, which is explained hereunder:

4.2 The functional structure is divided into two levels, one of management and the other, of implementation.

Management level

4.2.1 Within the management level are the resources of the ICAO Secretariat which assists the Chairman and Vicechairmain of the Subgroup, as well as the carrying out of the tasks related with 3 a), 3 b) y 3 c).

Implementation level

4.2.2 Within this level are the TORs macro-tasks 3a) y 3b). They are fundamentally developed by the ICAO Secretariat. Within the implementation of projects, a definition would have to be made of their implementation priorities, with the aim of obtaining a better efficiency in the works of the Subgroup. The deliverables (results) of these projects are achieved through the development of the activities established in the work programme, which will be implemented by the experts from the CAR/SAM States/Organizations providers and users. The number of experts to work in each project may vary, depending on the specialties and resources necessary to achieve the objectives and obtain the results in the scheduled period.

4.3 The Subgroup will count with a Chairman and Vicechairman, who will act in correspondence with the GREPECAS Handbook. The Chairman and Vicechairman will be elected by the CNS/ATM Subgroup.

4.4 The Secretariat will be appointed by the Secretary of GREPECAS, and would be composed by the Secretary from one of the areas (CNS or ATM) and a Co-secretary from the area or region opposite to the Secretary, who will be assisted by an ATM and a CNS Regional Officer, in a manner that the Secretariat will be composed by 4 Regional Officers: 2 CNS and 2 ATM.

4.5 The Work Groups initially considered will be the following:

- a) PBN
- b) ATFM
- c) Automation and Situational Awareness
- d) Ground-ground and air-ground communications infrastructure

4.6 Each Work Group will have assigned an initial number of projects, based on performance objectives. The Attachment to this Appendix indicates the projects associated to each Work Group.

4.7 The Secretariat, together with the Chairman, Vicechairman and Work Group coordinators, will form part of a Coordination Committee to periodically examine the operation of the Subgroup and the development of its activities. This Committee will work through electronic communications means to carry out coordinations. The Chairman and Secretary of the Subgroup will be responsible for the operation of this Committee, as per the GREPECAS Procedural Handbook.

5. MEETINGS OF THE SUBGROUP

5.1 The meetings of the Subgroup will be organized and held in accordance with the GREPECAS Procedural Handbook.

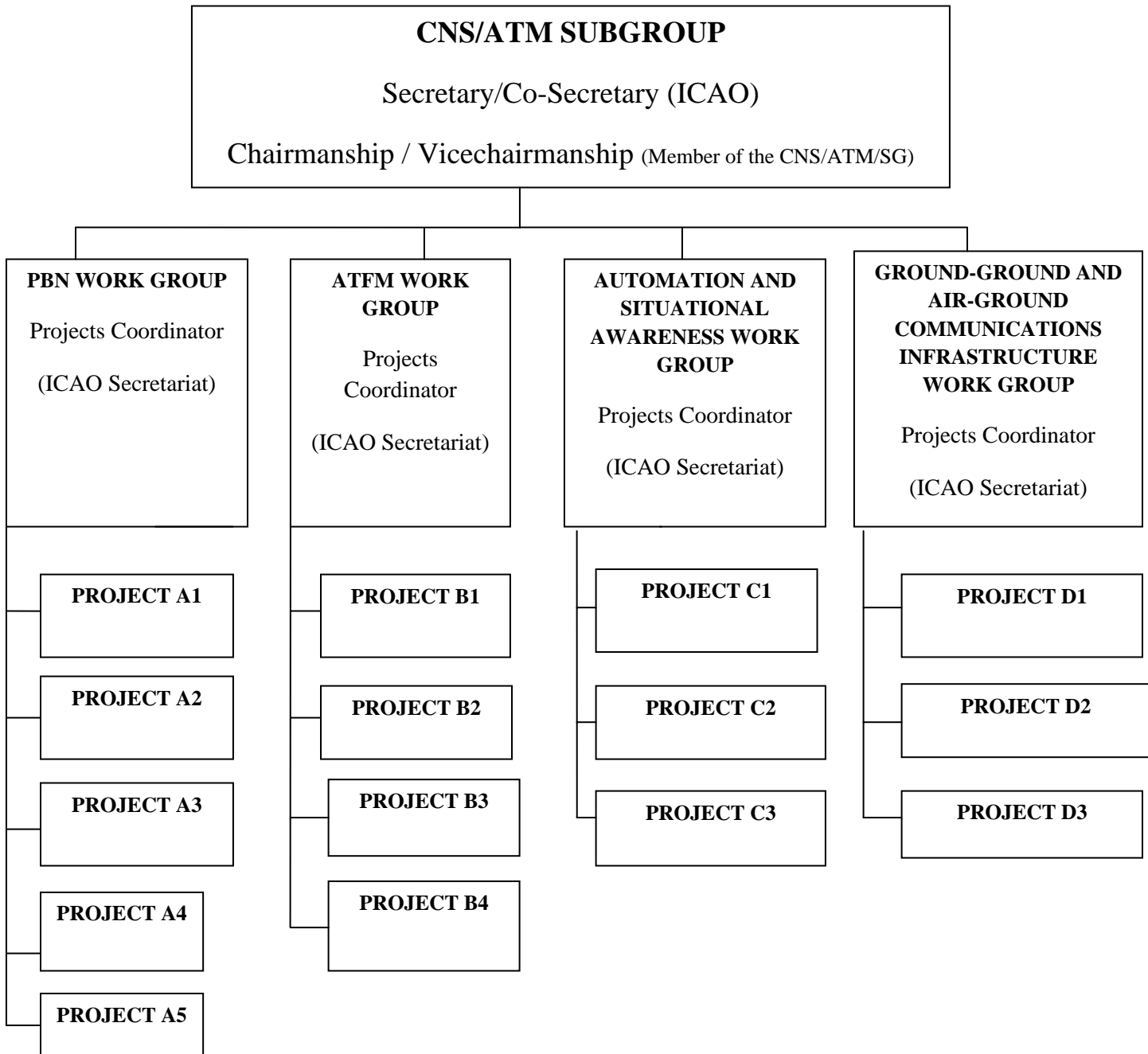
5.2 All documentation will generate from the Work Programme of the Subgroup and will be examined in the plenary sessions of the Subgroup. The Chairman of the Subgroup will be able to establish the ad-hoc groups it deems necessary to deepen into the analysis of the documentation presented during the plenary session.

5.3 The ad-hoc groups should not be identified as permanent groups associated to the projects, these groups cease their existence upon the ending of the meeting.

5.4 The Secretariat, in coordination with the Chairman of the Subgroup, will give due follow-up to the actions formulated in each meeting of the Subgroup, and will prepare the documentation to be presented by same, to the meetings of GREPECAS.

ATTACHMENT TO APPENDIX C

STRUCTURE OF THE CNS/ATM SUBGROUP



Note 1: Each project will have a project chief and a group of experts responsible for the carrying out of the activities scheduled in same. The persons forming part of the project will come from States and Organizations members of the CNS/ATM Subgroup.

Note 2: New Work Groups and projects will be established, as required on the basis of defined performance objectives.

PBN Work Group

- Project A1** Optimization of the en route airspace ATS routes structure
- Project A2** Optimization of the terminal area airspace ATS routes structure
- Project A3** Implement RNP approaches
- Project A4** Align upper airspace classification
- Project A5** Navigation systems in support of PBN

ATFM Work Group

- Project B1** Improve the balance between demand and capacity
- Project B2** Improve civil/military coordination and cooperation
- Project B3** Determine environmental benefits as consequence of short- and médium-term ATM improvements
- Project B4** RVSM

ATM Automation and Situational Awareness Work Group

- Project C1** Automation
- Project C2** Improve ATM situational awareness
- Project C3** Transition to the new ICAO Flight Plan Model

Ground-ground and ground-air communications infrastructure Work Group

- Project D1** CAR/SAM ATN architecture
- Project D2** ATN ground-ground applications
- Project D3** ATN ground-air applications

APPENDIX D

PROPOSAL ON THE WORKING METHODOLOGY AND STRUCTURE OF THE CNS/ATM SUBGROUP, ON THE BASIS OF WORK PLAN IMPLEMENTATION THROUGH TASK FORCES

1. OBJECTIVE

1.1 Present a working methodology to define and carry out work/project plans that satisfy the implementation of tasks assigned by GREPECAS to the CNS/ATM Subgroup and taken under consideration within its terms of reference (TORs).

2. GENERAL CONSIDERATIONS

2.1 The TORs of the CNS/ATM Subgroup, as well as the tasks that should be carried out to comply with same are shown in **Appendix A** to this working paper.

2.2 In the CNS/ATM Subgroup TORs, macro-tasks 3 a) and 3 b) represent permanent-type tasks. These tasks should be developed by the CNS/ATM Subgroup Secretariat, with the assistance of the Subgroup. During the meetings of the CNS/ATM Subgroup, the progress made on these macro-tasks would be reviewed.

2.3 As regards macro-task 3 c) of the CNS/ATM Subgroup TORs, which include the performance objectives indicated in **Appendix B** to this working paper, as well as possible new performance objectives, detailed tasks should be drafted as well as identify products to deliver with target dates, and monitor the implementation of the following:

- a) Performance based navigation
- b) Air traffic flow management
- c) Civil/military coordination
- d) Automation
- e) Situational awareness (surveillance)
- f) RVSM
- g) Ground-ground and ground-air communications infrastructure
- h) Transition to the new ICAO flight plan model
- i) Determine environmental benefits as consequence of short- and medium-term ATM improvements

3. WORKING METHODOLOGY

3.1 Development of TORs macro-tasks 3 a) and 3 b)

3.1.1 The review of the air navigation plan is a continuous task of the ICAO Secretariat, in coordination with States. The regional planning/implementation mechanisms examine the CAR/SAM Air Navigation Plan (CAR/SAM ANP), in correspondence to dynamic implementation processes. In addition, as consequence of the development of the TORs macro-task 3 c), amendments to the CAR/SAM ANP can originate. All these topics will be documented by the Secretariat and presented to the Subgroup for its consideration and later submittance to the consideration of GREPECAS, with the aim of counting with CAR/SAM amendments consolidated in the ANP.

3.1.2 The dealing of deficiencies in the CNS/ATM area would be developed taking under consideration the application of the methodology approved by Council to that effect; this has been complemented with an additional procedure approved by the ASB at GREPECAS/15 meeting. The Secretariat will present at each Subgroup meeting the status in the dealing of deficiencies; the Subgroup, considering the comments of the Secretariat, will examine them and will be able to formulate measures, in the event necessary, to facilitate the solution of the deficiencies. The results of this analysis will be sent to GREPECAS through the ASB.

3.2 Development of TORs macro-task 3 c)

3.2.1 The work of the CNS/ATM Subgroup will be developed under a performance based approach, using the performance reference frameworks (PFFs), where identification will be made of the ATM Operational Concept element, the deliverable or intermediate result with the associated Global Plan initiatives/strategies (GPI), the person responsible and the target date. It is important to note that the CAR and SAM Regions have execution plans on most of these topics. The work plans/projects should take under consideration the particular plans of each region and, fundamentally, harmonize them in the inter-regional interphase, with the aim of carrying out a CAR/SAM development planning.

3.2.2 For the carrying out of TORs macro-task 3 c), the Subgroup should count with a structure such as the shown in the **Attachment** to this Appendix.

3.2.3 The tasks detailed in the TORs macro-task 3 c) would be developed through four Task Forces, other task forces will be organized in the measure that new performance objectives are not covered by the existing task forces.

3.2.4 Each Task Force will develop the tasks assigned to it. The coordination of the tasks will be in charge of an ICAO ATM or CNS Regional Officer from the NACC and SAM Offices.

3.2.5 Each Task Force will have a Rapporteur and a group of CNS/ATM experts responsible for the carrying out of the tasks scheduled. The people to form part of the Task Force will come from States and Organizations members of the CNS/ATM Subgroup. The financing of the work of the experts in the work plans/projects will be covered by the States from which they come from. In certain cases to be identified, the ICAO regional technical cooperation projects might support in the compliance of the tasks.

3.2.6 In summary, the work of the Subgroup would be developed as follows:

- a) The coordinators will be the ATM and CNS Regional Officers from the NACC and SAM Offices, who in turn will be the focal points in the coordination of the tasks assigned and will provide assistance to the ATM and CNS experts of the Task Forces.
- b) The tasks will be carried out by experts that States/Territories/International Organizations name at meetings of the Subgroup, who should count with the total support in resources from their States/Territories/International Organizations, for the development of the activities required.
- c) The Subgroup will define the number of Task Forces necessary, and of the associated tasks. The implementation of new necessary Task Forces or the conclusion of an existing Task Force, will be decided upon by the Subgroup in plenary session.

- d) The Rapporteur, under coordination with the coordinator of the Task Force, will be responsible for the carrying out of the assigned tasks. The experts assigned will coordinate the carrying out of the tasks with the Rapporteur of the Task Force.
- e) To harmonize CAR and SAM developments, the carrying out of tasks might require the concurrence of experts from both regions, at a given moment.
- f) The experts will work through the use of the Internet and will be able to coordinate their work amongst them and the Regional Officers, through electronic means and/or teleconferences.
- g) In the event necessary, the Task Forces will be able to meet in order to coordinate the progress of their tasks.
- h) The experts will present their work at the dates required by the Subgroup, as indicated in the respective work plans/project in accordance with the work programme of the Subgroup.
- i) The coordinator of the Task Force will document the progress made with regard to the associated tasks and present a report in that respect at each meeting of the Subgroup.
- j) The Subgroup will examine the work developed by the Task Forces and will inform GREPECAS on their progress and results.
- k) Upon completing the work assigned to the Task Force, the experts assigned to that Task Force will end their assistance in the activities they were charged.

4. **FUNCTIONAL STRUCTURE OF THE CNS/ATM SUBGROUP**

4.1 The functional structure of the Subgroup proposed here, considers a simple organization for the Subgroup. The Attachment to this Appendix presents the functional structure proposed for the Subgroup, which is explained hereunder:

4.2 The functional structure is divided into two levels, one of management and the other, of implementation.

Management level

4.2.1 Within the management level are the resources of the ICAO Secretariat which assists the Chairman and Vicechairmain of the Subgroup.

Implementation level

4.2.2 Within this level are the tasks to be developed from the work plan and the TORs macro-tasks 3a) y 3b). Within the implementation of tasks, a definition would have to be made of their implementation priorities, with the aim of obtaining a better efficiency in the works of the Subgroup. The deliverables (results) of these tasks must be defined in the work programme of the Subgroup and further detailed in the work plans/projects. The number of experts to work in each Task Force may vary, depending on the specialties and resources necessary to achieve the objectives and obtain the results in the scheduled period.

- a) Each Task Force will have its work plan in accordance with the performance objective assigned, with a definite number of associated tasks.
- b) TORs macro-tasks 3 a) and 3 b) will be developed by the ICAO Secretariat.

4.3 The Subgroup will count with a Chairman and Vicechairman, who will act in correspondence with the GREPECAS Handbook. The Chairman and Vicechairman will be elected by the CNS/ATM Subgroup.

4.4 The Secretariat will be appointed by the Secretary of GREPECAS, and would be composed by the Secretary from one of the areas (CNS or ATM) and a Co-secretary, who will be assisted by an ATM and a CNS Regional Officer, in a manner that the Secretariat will be composed by 4 Regional Officers: 2 CNS and 2 ATM.

4.5 The Task Forces initially considered will be the following:

- a) PBN
- b) ATFM
- c) Automation and Situational Awareness
- d) Ground-ground and air-ground communications infrastructure

4.6 The Secretariat, together with the Chairman, Vicechairman and Task Force rapporteurs, will form part of a Coordination Committee to periodically examine the operation of the Subgroup and the development of its activities. This Committee will work through electronic communications means to carry out coordinations. The Chairman and Secretary of the Subgroup will be responsible for the operation of this Committee, as per the GREPECAS Procedural Handbook.

5. MEETINGS OF THE SUBGROUP

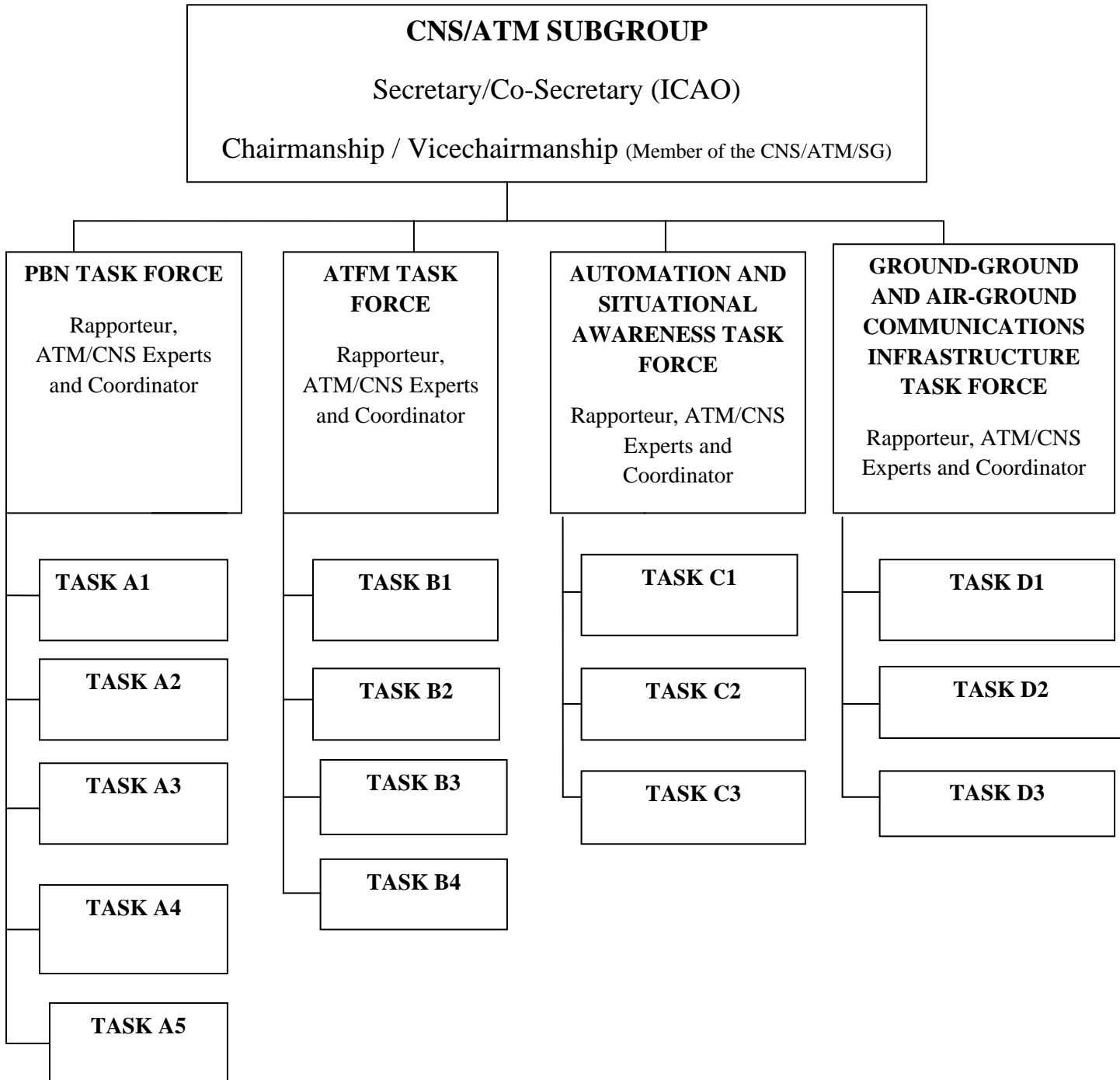
5.1 The meetings of the Subgroup will be organized and held in accordance with the GREPECAS Procedural Handbook.

5.2 All documentation will generate from the Work Programme of the Subgroup (Performance Based Air Navigation Implementation Plan for the CAR/SAM Regions) and will be examined in the plenary sessions of the Subgroup. The Chairman of the Subgroup will be able to establish the ad-hoc groups it deems necessary, to deepen into the analysis of the documentation presented during the plenary session.

5.3 The ad-hoc groups will cease their existence upon the ending of the meeting.

5.4 The Secretariat, in coordination with the Chairman of the Subgroup, will give due follow-up to the actions formulated in each meeting of the Subgroup, and will prepare the documentation to be presented by same, to the meetings of GREPECAS.

ATTACHMENT TO APPENDIX D
STRUCTURE OF THE CNS/ATM SUBGROUP



Note: New Task Forces will be established, as required, on the basis of defined performance objectives and of tasks not covered by any existing Task Force.

PBN Task Force

- Task A1** Optimization of the en route airspace ATS routes structure
- Task A2** Optimization of the terminal area airspace ATS routes structure
- Task A3** Implement RNP approaches
- Task A4** Align upper airspace classification
- Task A5** Navigation systems in support of PBN

ATFM Task Force

- Task B1** Improve the balance between demand and capacity
- Task B2** Improve civil/military coordination and cooperation
- Task B3** Implement the flexible use of the airspace (FUA)
- Task B4** RVSM

ATM Automation and Situational Awareness Task Force

- Task C1** Automation
- Task C2** Improve ATM situational awareness
- Task C3** Transition to the new ICAO Flight Plan Model

Ground-ground and ground-air communications infrastructure Task Force

- Task D1** CAR/SAM ATN architecture
- Task D2** ATN ground-ground applications
- Task D3** ATN ground-air applications